

## 4.0 Critical Reasoning

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Critical reasoning questions appear in the Verbal section of the GMAT® exam. The Verbal section uses multiple-choice questions to measure your ability to read and comprehend written material, to reason and to evaluate arguments, and to correct written material to conform to standard written English. Because the Verbal section includes content from a variety of topics, you may be generally familiar with some of the material; however, neither the passages nor the questions assume knowledge of the topics discussed. Critical reasoning questions are intermingled with reading comprehension and sentence correction questions throughout the Verbal section of the test.

You will have 75 minutes to complete the Verbal section, or about 1¾ minutes to answer each question. Although critical reasoning questions are based on written passages, these passages are shorter than reading comprehension passages. They tend to be less than 100 words in length and generally are followed by one or two questions. For these questions, you will see a split computer screen. The written passage will remain visible at the top of the screen. In turn, each associated question will appear below the relevant passage.

Critical reasoning questions are designed to test the reasoning skills involved in (1) making arguments, (2) evaluating arguments, and (3) formulating or evaluating a plan of action. The materials on which questions are based are drawn from a variety of sources. The GMAT exam does not expect any familiarity with the subject matter of those materials.

In these questions, you are to analyze the situation on which each question is based, and then select the answer choice that most appropriately answers the question. Begin by reading the passages carefully, then reading the five answer choices. If the correct answer is not immediately obvious to you, see whether you can eliminate some of the wrong answers. Reading the passage a second time may be helpful in illuminating subtleties that were not immediately evident.

Answering critical reasoning questions requires no specialized knowledge of any particular field; you don't have to have knowledge of the terminology and conventions of formal logic. The sample critical reasoning questions in this chapter illustrate the variety of topics the test may cover, the kinds of questions it may ask, and the level of analysis it requires.

The following pages describe what critical reasoning questions are designed to measure and present the directions that will precede questions of this type. Sample questions and explanations of the correct answers follow.

## 4.1 What Is Measured

Critical reasoning questions are designed to provide one measure of your ability to reason effectively in the following areas:

- **Argument construction**

Questions in this category may ask you to recognize such things as the basic structure of an argument, properly drawn conclusions, underlying assumptions, well-supported explanatory hypotheses, and parallels between structurally similar arguments.

- **Argument evaluation**

These questions may ask you to analyze a given argument and to recognize such things as factors that would strengthen or weaken the given argument; reasoning errors committed in making that argument; and aspects of the method by which the argument proceeds.

- **Formulating and evaluating a plan of action**

This type of question may ask you to recognize such things as the relative appropriateness, effectiveness, or efficiency of different plans of action, factors that would strengthen or weaken the prospects of success of a proposed plan of action, and assumptions underlying a proposed plan of action.

## 4.2 Test-Taking Strategies

**1. Read very carefully the set of statements on which a question is based.**

Pay close attention to

- what is put forward as factual information
- what is not said but necessarily follows from what is said
- what is claimed to follow from facts that have been put forward
- how well substantiated are any claims that a particular conclusion follows from the facts that have been put forward

In reading the arguments, it is important to pay attention to the logical reasoning used; the actual truth of statements portrayed as fact is not important.

**2. Identify the conclusion.**

The conclusion does not necessarily come at the end of the text; it may come somewhere in the middle or even at the beginning. Be alert to clues in the text that an argument follows logically from another statement or statements in the text.

**3. Determine exactly what each question asks.**

You might find it helpful to read the question first, before reading the material on which it is based; don't assume that you know what you will be asked about an argument. An argument may have obvious flaws, and one question may ask you to detect them. Other questions may direct you to select the one answer choice that does NOT describe a flaw in the argument.

**4. Read all the answer choices carefully.**

Do not assume that a given answer is the best without first reading all the choices.

## **4.3 The Directions**

These are the directions you will see for critical reasoning questions when you take the GMAT exam. If you read them carefully and understand them clearly before going to sit for the test, you will not need to spend too much time reviewing them when you are at the test center and the test is

under way.

For these questions, select the best of the answer choices given.

## 4.4 Sample Questions

Each of the [critical reasoning](#) questions is based on a short argument, a set of statements, or a plan of action. For each question, select the best answer of the choices given.

106. PhishCo runs a number of farms in the arid province of Nufa, depending largely on irrigation. Now, as part of a plan to efficiently increase the farms' total production, it plans to drill down to an aquifer containing warm, slightly salty water that will be used to raise fish in ponds. The water from the ponds will later be used to supplement piped-in irrigation water for PhishCo's vegetable fields, and the ponds and accompanying vegetation should help reduce the heat in the area of the farms.

Which of the following would, if true, most strongly suggest that the plan, if implemented, would increase the overall efficiency of PhishCo's farms?

- A. Most of the vegetation to be placed around the ponds is native to Nufa.
  - B. Fish raised on PhishCo's farms are likely to be saleable in the nearest urban areas.
  - C. Organic waste from fish in the pond water will help to fertilize fields where it is used for irrigation.
  - D. The government of Nufa will help to arrange loan financing to partially cover the costs of drilling.
  - E. Ponds will be located on low-lying land now partially occupied by grain crops.
107. The sustained massive use of pesticides in farming has two effects that are especially pernicious. First, it often kills off the pests' natural enemies in the area. Second, it often unintentionally gives rise to insecticide-resistant pests, since those insects that survive a particular insecticide will be the ones most resistant to it, and

they are the ones left to breed.

From the passage above, it can be properly inferred that the effectiveness of the sustained massive use of pesticides can be extended by doing which of the following, assuming that each is a realistic possibility?

- A. Using only chemically stable insecticides
- B. Periodically switching the type of insecticide used
- C. Gradually increasing the quantities of pesticides used
- D. Leaving a few fields fallow every year
- E. Breeding higher-yielding varieties of crop plants

108. Which of the following, if true, most logically completes the argument below?

Manufacturers are now required to make all cigarette lighters child-resistant by equipping them with safety levers. But this change is unlikely to result in a significant reduction in the number of fires caused by children playing with lighters, because children given the opportunity can figure out how to work the safety levers and \_\_\_\_\_.

- A. the addition of the safety levers has made lighters more expensive than they were before the requirement was instituted
- B. adults are more likely to leave child-resistant lighters than non-child-resistant lighters in places that are accessible to children
- C. many of the fires started by young children are quickly detected and extinguished by their parents
- D. unlike child-resistant lighters, lighters that are not child-resistant can be operated by children as young as two years old
- E. approximately 5,000 fires per year have been attributed to children playing with lighters before the safety levers were required

109. Which of the following most logically completes the passage?

A business analysis of the Appenian railroad system divided its long-distance passenger routes into two categories: rural routes and interurban routes. The analysis found that, unlike the interurban routes, few rural routes carried a high enough passenger volume to be profitable. Closing unprofitable rural routes, however, will not necessarily enhance the profitability of the whole system, since \_\_\_\_\_.

- A. a large part of the passenger volume on interurban routes is accounted for by passengers who begin or end their journeys on rural routes
  - B. within the last two decades several of the least used rural routes have been closed and their passenger services have been replaced by buses
  - C. the rural routes were all originally constructed at least one hundred years ago, whereas some of the interurban routes were constructed recently for new high-speed express trains
  - D. not all of Appenia's large cities are equally well served by interurban railroad services
  - E. the greatest passenger volume, relative to the routes' capacity, is not on either category of long-distance routes but is on suburban commuter routes
110. Although Ackerburg's subway system is currently operating at a deficit, the transit authority will lower subway fares next year. The authority projects that the lower fares will result in a ten percent increase in the number of subway riders. Since the additional income from the larger ridership will more than offset the decrease due to lower fares, the transit authority actually expects the fare reduction to reduce or eliminate the subway system's operating deficit for next year.

Which of the following, if true, provides the most support for the transit authority's expectation of reducing the subway system's operating deficit?

- A. Throughout the years that the subway system has operated, fares have never before been reduced.
- B. The planned fare reduction will not apply to students, who

can already ride the subway for a reduced fare.

- C. Next year, the transit authority will have to undertake several large-scale track maintenance projects.
  - D. The subway system can accommodate a ten percent increase in ridership without increasing the number of trains it runs each day.
  - E. The current subway fares in Ackerburg are higher than subway fares in other cities in the region.
111. Patrick usually provides child care for six children. Parents leave their children at Patrick's house in the morning and pick them up after work. At the end of each workweek, the parents pay Patrick at an hourly rate for the child care provided that week. The weekly income Patrick receives is usually adequate but not always uniform, particularly in the winter, when children are likely to get sick and be unpredictably absent.

Which of the following plans, if put into effect, has the best prospect of making Patrick's weekly income both uniform and adequate?

- A. Pool resources with a neighbor who provides child care under similar arrangements, so that the two of them cooperate in caring for twice as many children as Patrick currently does.
- B. Replace payment by actual hours of child care provided with a fixed weekly fee based upon the number of hours of child care that Patrick would typically be expected to provide.
- C. Hire a full-time helper and invest in facilities for providing child care to sick children.
- D. Increase the hourly rate to a level that would provide adequate income even in a week when half of the children Patrick usually cares for are absent.
- E. Increase the number of hours made available for child care each day, so that parents can leave their children in Patrick's care for a longer period each day at the current

hourly rate.

112. Editorial: Consumers in North America think that by drinking frozen concentrated orange juice, they are saving energy, because it takes fewer truckloads to transport it than it takes to transport an equivalent amount of not-from-concentrate juice. But they are mistaken, for the amount of energy required to concentrate the juice is far greater than the energy difference in the juices' transport.

Which of the following, if true, would provide the greatest additional support for the editorial's conclusion?

- A. Freezer trucks use substantially more energy per mile driven than do any other types of trucks.
  - B. Frozen juice can be stored for several years, while not-from-concentrate juice lasts a much shorter time.
  - C. Oranges grown in Brazil make up an increasing percentage of the fruit used in not-from-concentrate juice production.
  - D. A serving of not-from-concentrate juice takes up to six times more space than a serving of frozen concentrated juice.
  - E. Though frozen concentrated juice must be kept at a lower temperature, not-from-concentrate juice is far more sensitive to small temperature fluctuations.
113. A computer equipped with signature-recognition software, which restricts access to a computer to those people whose signatures are on file, identifies a person's signature by analyzing not only the form of the signature but also such characteristics as pen pressure and signing speed. Even the most adept forgers cannot duplicate all of the characteristics the program analyzes.

Which of the following can be logically concluded from the passage above?

- A. The time it takes to record and analyze a signature makes the software impractical for everyday use.
- B. Computers equipped with the software will soon be installed in most banks.



- C. Nobody can gain access to a computer equipped with the software solely by virtue of skill at forging signatures.
  - D. Signature-recognition software has taken many years to develop and perfect.
  - E. In many cases even authorized users are denied legitimate access to computers equipped with the software.
114. The rate at which a road wears depends on various factors, including climate, amount of traffic, and the size and weight of the vehicles using it. The only land transportation to Rittland's seaport is via a divided highway, one side carrying traffic to the seaport and one carrying traffic away from it. The side leading to the seaport has worn faster, even though each side has carried virtually the same amount of traffic, consisting mainly of large trucks.

Which of the following, if true, most helps to explain the difference in the rate of wear?

- A. The volume of traffic to and from Rittland's seaport has increased beyond the intended capacity of the highway that serves it.
  - B. Wear on the highway that serves Rittland's seaport is considerably greater during the cold winter months.
  - C. Wear on the side of the highway that leads to Rittland's seaport has encouraged people to take buses to the seaport rather than driving there in their own automobiles.
  - D. A greater tonnage of goods is exported from Rittland's seaport than is imported through it.
  - E. All of Rittland's automobiles are imported by ship.
115. In parts of South America, vitamin-A deficiency is a serious health problem, especially among children. In one region, agriculturists are attempting to improve nutrition by encouraging farmers to plant a new variety of sweet potato called SPK004 that is rich in beta-carotene, which the body converts into vitamin A. The plan has good chances of success, since sweet potato is a staple of the region's diet and agriculture, and the varieties

currently grown contain little beta-carotene.

Which of the following, if true, most strongly supports the prediction that the plan will succeed?

- A. The growing conditions required by the varieties of sweet potato currently cultivated in the region are conditions in which SPK004 can flourish.
  - B. The flesh of SPK004 differs from that of the currently cultivated sweet potatoes in color and texture, so traditional foods would look somewhat different when prepared from SPK004.
  - C. There are no other varieties of sweet potato that are significantly richer in beta-carotene than SPK004 is.
  - D. The varieties of sweet potato currently cultivated in the region contain some important nutrients that are lacking in SPK004.
  - E. There are other vegetables currently grown in the region that contain more beta-carotene than the currently cultivated varieties of sweet potato do.
116. Which of the following most logically completes the argument?

The last members of a now-extinct species of a European wild deer called the giant deer lived in Ireland about 16,000 years ago. Prehistoric cave paintings in France depict this animal as having a large hump on its back. Fossils of this animal, however, do not show any hump. Nevertheless, there is no reason to conclude that the cave paintings are therefore inaccurate in this regard, since

\_\_\_\_\_.

- A. some prehistoric cave paintings in France also depict other animals as having a hump
- B. fossils of the giant deer are much more common in Ireland than in France
- C. animal humps are composed of fatty tissue, which does not fossilize
- D. the cave paintings of the giant deer were painted well before

16,000 years ago

- E. only one currently existing species of deer has any anatomical feature that even remotely resembles a hump
117. High levels of fertilizer and pesticides, needed when farmers try to produce high yields of the same crop year after year, pollute water supplies. Experts therefore urge farmers to diversify their crops and to rotate their plantings yearly.

To receive governmental price-support benefits for a crop, farmers must have produced that same crop for the past several years.

The statements above, if true, best support which of the following conclusions?

- A. The rules for governmental support of farm prices work against efforts to reduce water pollution.
  - B. The only solution to the problem of water pollution from fertilizers and pesticides is to take farmland out of production.
  - C. Farmers can continue to make a profit by rotating diverse crops, thus reducing costs for chemicals, but not by planting the same crop each year.
  - D. New farming techniques will be developed to make it possible for farmers to reduce the application of fertilizers and pesticides.
  - E. Governmental price supports for farm products are set at levels that are not high enough to allow farmers to get out of debt.
118. Ten years ago the number of taxpayers in Greenspace County was slightly greater than the number of registered voters. The number of taxpayers has doubled over the last ten years, while the number of registered voters has increased, but at a lower rate than has the number of taxpayers.

Which of the following must be true in Greenspace County if the statements above are true?

- A. The number of taxpayers is now smaller than the number of registered voters.
  - B. Everyone who is a registered voter is also a taxpayer.
  - C. The proportion of registered voters to taxpayers has increased over the last ten years.
  - D. The proportion of registered voters to taxpayers has decreased over the last ten years.
  - E. The proportion of registered voters to taxpayers has remained unchanged over the last ten years.
119. The interview is an essential part of a successful hiring program because, with it, job applicants who have personalities that are unsuited to the requirements of the job will be eliminated from consideration.

The argument above logically depends on which of the following assumptions?

- A. A hiring program will be successful if it includes interviews.
  - B. The interview is a more important part of a successful hiring program than is the development of a job description.
  - C. Interviewers can accurately identify applicants whose personalities are unsuited to the requirements of the job.
  - D. The only purpose of an interview is to evaluate whether job applicants' personalities are suited to the requirements of the job.
  - E. The fit of job applicants' personalities to the requirements of the job was once the most important factor in making hiring decisions.
120. Many leadership theories have provided evidence that leaders affect group success rather than the success of particular individuals. So it is irrelevant to analyze the effects of supervisor traits on the attitudes of individuals whom they supervise. Instead, assessment of leadership effectiveness should occur only at the group level.

Which of the following would it be most useful to establish in order to evaluate the argument?

- A. Whether supervisors' documentation of individual supervisees' attitudes toward them is usually accurate
  - B. Whether it is possible to assess individual supervisees' attitudes toward their supervisors without thereby changing those attitudes
  - C. Whether any of the leadership theories in question hold that leaders should assess other leaders' attitudes
  - D. Whether some types of groups do not need supervision in order to be successful in their endeavors
  - E. Whether individuals' attitudes toward supervisors affect group success
121. A major health insurance company in Lagolia pays for special procedures prescribed by physicians only if the procedure is first approved as "medically necessary" by a company-appointed review panel. The rule is intended to save the company the money it might otherwise spend on medically unnecessary procedures. The company has recently announced that in order to reduce its costs, it will abandon this rule.

Which of the following, if true, provides the strongest justification for the company's decision?

- A. Patients often register dissatisfaction with physicians who prescribe nothing for their ailments.
- B. Physicians often prescribe special procedures that are helpful but not altogether necessary for the health of the patient.
- C. The review process is expensive and practically always results in approval of the prescribed procedure.
- D. The company's review process does not interfere with the prerogative of physicians, in cases where more than one effective procedure is available, to select the one they personally prefer.

- E. The number of members of the company-appointed review panel who review a given procedure depends on the cost of the procedure.
122. To evaluate a plan to save money on office-space expenditures by having its employees work at home, XYZ Company asked volunteers from its staff to try the arrangement for six months. During this period, the productivity of these employees was as high as or higher than before.

Which of the following, if true, would argue most strongly against deciding, on the basis of the trial results, to implement the company's plan?

- A. The employees who agreed to participate in the test of the plan were among the company's most self-motivated and independent workers.
  - B. The savings that would accrue from reduced office-space expenditures alone would be sufficient to justify the arrangement for the company, apart from any productivity increases.
  - C. Other companies that have achieved successful results from work-at-home plans have workforces that are substantially larger than that of XYZ.
  - D. The volunteers who worked at home were able to communicate with other employees as necessary for performing the work.
  - E. Minor changes in the way office work is organized at XYZ would yield increases in employee productivity similar to those achieved in the trial.
123. Consumer health advocate: Your candy company adds caffeine to your chocolate candy bars so that each one delivers a specified amount of caffeine. Since caffeine is highly addictive, this indicates that you intend to keep your customers addicted.

Candy manufacturer: Our manufacturing process results in there being less caffeine in each chocolate candy bar than in the unprocessed cacao beans from which the chocolate is made.

The candy manufacturer's response is flawed as a refutation of the consumer health advocate's argument because it

- A. fails to address the issue of whether the level of caffeine in the candy bars sold by the manufacturer is enough to keep people addicted
  - B. assumes without warrant that all unprocessed cacao beans contain a uniform amount of caffeine
  - C. does not specify exactly how caffeine is lost in the manufacturing process
  - D. treats the consumer health advocate's argument as though it were about each candy bar rather than about the manufacturer's candy in general
  - E. merely contradicts the consumer health advocate's conclusion without giving any reason to believe that the advocate's reasoning is unsound
124. Nutritionists are advising people to eat more fish, since the omega-3 fatty acids in fish help combat many diseases. If everyone took this advice, however, there would not be enough fish in oceans, rivers, and lakes to supply the demand; the oceans are already being overfished. The obvious method to ease the pressure on wild fish populations is for people to increase their consumption of farmed fish.

Which of the following, if true, raises the most serious doubt concerning the prospects for success of the solution proposed above?

- A. Aquaculture, or fish farming, raises more fish in a given volume of water than are generally present in the wild.
- B. Some fish farming, particularly of shrimp and other shellfish, takes place in enclosures in the ocean.
- C. There are large expanses of ocean waters that do not contain enough nutrients to support substantial fish populations.
- D. The feed for farmed ocean fish is largely made from small wild-caught fish, including the young of many popular food

species.

- E. Some of the species that are now farmed extensively were not commonly eaten when they were only available in the wild.

125. Crops can be traded on the futures market before they are harvested. If a poor corn harvest is predicted, prices of corn futures rise; if a bountiful corn harvest is predicted, prices of corn futures fall. This morning meteorologists are predicting much-needed rain for the corn-growing region starting tomorrow. Therefore, since adequate moisture is essential for the current crop's survival, prices of corn futures will fall sharply today.

Which of the following, if true, most weakens the argument above?

- A. Corn that does not receive adequate moisture during its critical pollination stage will not produce a bountiful harvest.
  - B. Futures prices for corn have been fluctuating more dramatically this season than last season.
  - C. The rain that meteorologists predicted for tomorrow is expected to extend well beyond the corn-growing region.
  - D. Agriculture experts announced today that a disease that has devastated some of the corn crop will spread widely before the end of the growing season.
  - E. Most people who trade in corn futures rarely take physical possession of the corn they trade.
126. Large national budget deficits do not cause large trade deficits. If they did, countries with the largest budget deficits would also have the largest trade deficits. In fact, when deficit figures are adjusted so that different countries are reliably comparable to each other, there is no such correlation.

If the statements above are all true, which of the following can properly be inferred on the basis of them?

- A. Countries with large national budget deficits tend to restrict foreign trade.



- B. Reliable comparisons of the deficit figures of one country with those of another are impossible.
- C. Reducing a country's national budget deficit will not necessarily result in a lowering of any trade deficit that country may have.
- D. When countries are ordered from largest to smallest in terms of population, the smallest countries generally have the smallest budget and trade deficits.
- E. Countries with the largest trade deficits never have similarly large national budget deficits.

127. Which of the following best completes the passage below?

The more worried investors are about losing their money, the more they will demand a high potential return on their investment; great risks must be offset by the chance of great rewards. This principle is the fundamental one in determining interest rates, and it is illustrated by the fact that

- A. successful investors are distinguished by an ability to make very risky investments without worrying about their money
- B. lenders receive higher interest rates on unsecured loans than on loans backed by collateral
- C. in times of high inflation, the interest paid to depositors by banks can actually be below the rate of inflation
- D. at any one time, a commercial bank will have a single rate of interest that it will expect all of its individual borrowers to pay
- E. the potential return on investment in a new company is typically lower than the potential return on investment in a well-established company

128. It is often said that high rates of inflation tend to diminish people's incentive to save and invest. This view must be incorrect, however, because people generally saved and invested more of their income in the 1970's when inflation rates were high than they did in the 1980's when inflation rates were low.

Of the following, the best criticism of the argument above is that it overlooks the possibility that

- A. all people do not respond in the same way to a given economic stimulus
- B. certain factors operating in the 1980's but not in the 1970's diminished people's incentive to save and invest
- C. the population was larger in the 1980's than it was in the 1970's
- D. the proponents of the view cited would stand to gain if inflation rates become lower
- E. a factor that affects people's savings behavior in a certain way could affect people's investment behavior quite differently

129. Which of the following most logically completes the argument below?

Within the earth's core, which is iron, pressure increases with depth. Because the temperature at which iron melts increases with pressure, the inner core is solid and the outer core is molten. Physicists can determine the melting temperature of iron at any given pressure and the pressure for any given depth in the earth. Therefore, the actual temperature at the boundary of the earth's outer and inner cores—the melting temperature of iron there—can be determined, since \_\_\_\_\_.

- A. the depth beneath the earth's surface of the boundary between the outer and inner cores is known
- B. some of the heat from the earth's core flows to the surface of the earth
- C. pressures within the earth's outer core are much greater than pressures above the outer core
- D. nowhere in the earth's core can the temperature be measured directly
- E. the temperatures within the earth's inner core are higher than in the outer core

130. Which of the following most logically completes the reasoning?

Either food scarcity or excessive hunting can threaten a population of animals. If the group faces food scarcity, individuals in the group will reach reproductive maturity later than otherwise. If the group faces excessive hunting, individuals that reach reproductive maturity earlier will come to predominate. Therefore, it should be possible to determine whether prehistoric mastodons became extinct because of food scarcity or human hunting, since there are fossilized mastodon remains from both before and after mastodon populations declined, and \_\_\_\_\_.

- A. there are more fossilized mastodon remains from the period before mastodon populations began to decline than from after that period
- B. the average age at which mastodons from a given period reached reproductive maturity can be established from their fossilized remains
- C. it can be accurately estimated from fossilized remains when mastodons became extinct
- D. it is not known when humans first began hunting mastodons
- E. climate changes may have gradually reduced the food available to mastodons

131. Unlike the wholesale price of raw wool, the wholesale price of raw cotton has fallen considerably in the last year. Thus, although the retail price of cotton clothing at retail clothing stores has not yet fallen, it will inevitably fall.

Which of the following, if true, most seriously weakens the argument above?

- A. The cost of processing raw cotton for cloth has increased during the last year.
- B. The wholesale price of raw wool is typically higher than that of the same volume of raw cotton.
- C. The operating costs of the average retail clothing store have

remained constant during the last year.

- D. Changes in retail prices always lag behind changes in wholesale prices.
- E. The cost of harvesting raw cotton has increased in the last year.

132. Many office buildings designed to prevent outside air from entering have been shown to have elevated levels of various toxic substances circulating through the air inside, a phenomenon known as sick building syndrome. Yet the air in other office buildings does not have elevated levels of these substances, even though those buildings are the same age as the “sick” buildings and have similar designs and ventilation systems.

Which of the following, if true, most helps to explain why not all office buildings designed to prevent outside air from entering have air that contains elevated levels of toxic substances?

- A. Certain adhesives and drying agents used in particular types of furniture, carpets, and paint contribute the bulk of the toxic substances that circulate in the air of office buildings.
  - B. Most office buildings with sick building syndrome were built between 1950 and 1990.
  - C. Among buildings designed to prevent outside air from entering, houses are no less likely than office buildings to have air that contains elevated levels of toxic substances.
  - D. The toxic substances that are found in the air of “sick” office buildings are substances that are found in at least small quantities in nearly every building.
  - E. Office buildings with windows that can readily be opened are unlikely to suffer from sick building syndrome.
133. Newsletter: **A condominium generally offers more value for its cost than an individual house because of economies of scale.** The homeowners in a condominium association can collectively buy products and services that they could not afford on their own. And since a professional management company handles maintenance of common areas,

**condominium owners spend less time and money on maintenance than individual homeowners do.**

The two portions in boldface play which of the following roles in the newsletter's argument?

- A. The first is the argument's main conclusion; the second is another conclusion supporting the first.
  - B. The first is a premise, for which no evidence is provided; the second is the argument's only conclusion.
  - C. The first is a conclusion supporting the second; the second is the argument's main conclusion.
  - D. The first is the argument's only conclusion; the second is a premise, for which no evidence is provided.
  - E. Both are premises, for which no evidence is provided, and both support the argument's only conclusion.
134. Which of the following most logically completes the argument?

When officials in Tannersburg released their plan to widen the city's main roads, environmentalists protested that widened roads would attract more traffic and lead to increased air pollution. In response, city officials pointed out that today's pollution-control devices are at their most effective in vehicles traveling at higher speeds and that widening roads would increase the average speed of traffic. However, this effect can hardly be expected to offset the effect pointed out by environmentalists, since \_\_\_\_\_.

- A. increases in traffic volume generally produce decreases in the average speed of traffic unless roads are widened
- B. several of the roads that are slated for widening will have to be closed temporarily while construction is underway
- C. most of the air pollution generated by urban traffic comes from vehicles that do not have functioning pollution-control devices
- D. the newly widened roads will not have increased traffic volume if the roads that must be used to reach them are

inadequate

- E. a vehicle traveling on a route that goes through Tannersburg will spend less time on Tannersburg's roads once the roads are widened

135. Premature babies who receive regular massages are more active than premature babies who do not. Even when all the babies drink the same amount of milk, the massaged babies gain more weight than do the unmassaged babies. This is puzzling because a more active person generally requires a greater food intake to maintain or gain weight.

Which of the following, if true, best reconciles the apparent discrepancy described above?

- A. Increased activity leads to increased levels of hunger, especially when food intake is not also increased.
- B. Massage increases premature babies' curiosity about their environment, and curiosity leads to increased activity.
- C. Increased activity causes the intestines of premature babies to mature more quickly, enabling the babies to digest and absorb more of the nutrients in the milk they drink.
- D. Massage does not increase the growth rate of babies over one year old, if the babies had not been previously massaged.
- E. Premature babies require a daily intake of nutrients that is significantly higher than that required by babies who were not born prematurely.

136. An eyeglass manufacturer tried to boost sales for the summer quarter by offering its distributors a special discount if their orders for that quarter exceeded those for last year's summer quarter by at least 20 percent. Many distributors qualified for this discount. Even with much merchandise discounted, sales increased enough to produce a healthy gain in net profits. The manufacturer plans to repeat this success by offering the same sort of discount for the fall quarter.

Which of the following, if true, most clearly points to a flaw in the

manufacturer's plan to repeat the successful performance of the summer quarter?

- A. In general, a distributor's orders for the summer quarter are no higher than those for the spring quarter.
- B. Along with offering special discounts to qualifying distributors, the manufacturer increased newspaper and radio advertising in those distributors' sales areas.
- C. The distributors most likely to qualify for the manufacturer's special discount are those whose orders were unusually low a year earlier.
- D. The distributors who qualified for the manufacturer's special discount were free to decide how much of that discount to pass on to their own customers.
- E. The distributors' ordering more goods in the summer quarter left them overstocked for the fall quarter.

137. Which of the following, if true, most logically completes the argument?

Some dairy farmers in the province of Takandia want to give their cows a synthetic hormone that increases milk production. Many Takandians, however, do not want to buy milk from cows given the synthetic hormone. For this reason Takandia's legislature is considering a measure requiring milk from cows given the hormone to be labeled as such. Even if the measure is defeated, dairy farmers who use the hormone will probably lose customers, since \_\_\_\_\_.

- A. it has not been proven that any trace of the synthetic hormone exists in the milk of cows given the hormone
- B. some farmers in Takandia who plan to use the synthetic hormone will probably not do so if the measure were passed
- C. milk from cows that have not been given the synthetic hormone can be labeled as such without any legislative action
- D. the legislature's consideration of the bill has been widely publicized

- E. milk that comes from cows given the synthetic hormone looks and tastes the same as milk from cows that have not received the hormone
138. Budget constraints have made police officials consider reassigning a considerable number of officers from traffic enforcement to work on higher-priority, serious crimes. Reducing traffic enforcement for this reason would be counterproductive, however, in light of the tendency of criminals to use cars when engaged in the commission of serious crimes. An officer stopping a car for a traffic violation can make a search that turns up evidence of serious crime.

Which of the following, if true, most strengthens the argument given?

- A. An officer who stops a car containing evidence of the commission of a serious crime risks a violent confrontation, even if the vehicle was stopped only for a traffic violation.
  - B. When the public becomes aware that traffic enforcement has lessened, it typically becomes lax in obeying traffic rules.
  - C. Those willing to break the law to commit serious crimes are often in committing such crimes unwilling to observe what they regard as the lesser constraints of traffic law.
  - D. The offenders committing serious crimes who would be caught because of traffic violations are not the same group of individuals as those who would be caught if the arresting officers were reassigned from traffic enforcement.
  - E. The great majority of persons who are stopped by officers for traffic violations are not guilty of any serious crimes.
139. Conventional wisdom suggests vaccinating elderly people first in flu season, because they are at greatest risk of dying if they contract the virus. This year's flu virus poses particular risk to elderly people and almost none at all to younger people, particularly children. Nevertheless, health professionals are recommending vaccinating children first against the virus rather than elderly people.



Which of the following, if true, provides the strongest reason for the health professionals' recommendation?

- A. Children are vulnerable to dangerous infections when their immune systems are severely weakened by other diseases.
  - B. Children are particularly unconcerned with hygiene and therefore are the group most responsible for spreading the flu virus to others.
  - C. The vaccinations received last year will confer no immunity to this year's flu virus.
  - D. Children who catch one strain of the flu virus and then recover are likely to develop immunity to at least some strains with which they have not yet come in contact.
  - E. Children are no more likely than adults to have immunity to a particular flu virus if they have never lived through a previous epidemic of the same virus.
140. Pro-Tect Insurance Company has recently been paying out more on car-theft claims than it expected. Cars with special antitheft devices or alarm systems are much less likely to be stolen than are other cars. Consequently Pro-Tect, as part of an effort to reduce its annual payouts, will offer a discount to holders of car-theft policies if their cars have antitheft devices or alarm systems.

Which of the following, if true, provides the strongest indication that the plan is likely to achieve its goal?

- A. The decrease in the risk of car theft conferred by having a car alarm is greatest when only a few cars have such alarms.
- B. The number of policyholders who have filed a claim in the past year is higher for Pro-Tect than for other insurance companies.
- C. In one or two years, the discount that Pro-Tect is offering will amount to more than the cost of buying certain highly effective antitheft devices.
- D. Currently, Pro-Tect cannot legally raise the premiums it charges for a given amount of insurance against car theft.

- E. The amount Pro-Tect has been paying out on car-theft claims has been greater for some models of car than for others.

141. While the total enrollment of public elementary and secondary schools in Sondland is one percent higher this academic year than last academic year, the number of teachers there increased by three percent. Thus, the Sondland Education Commission's prediction of a teacher shortage as early as next academic year is unfounded.

Which of the following, if true, most seriously weakens the claim that the prediction of a teacher shortage as early as next academic year is unfounded?

- A. Funding for public elementary schools in Sondland is expected to increase over the next ten years.
  - B. Average salaries for Sondland's teachers increased at the rate of inflation from last academic year to this academic year.
  - C. A new law has mandated that there be ten percent more teachers per pupil in Sondland's public schools next academic year than there were this academic year.
  - D. In the past, increases in enrollments in public elementary and secondary schools in Sondland have generally been smaller than increases in the number of teachers.
  - E. Because of reductions in funding, the number of students enrolling in teacher-training programs in Sondland is expected to decline beginning in the next academic year.
142. Art restorers who have been studying the factors that cause Renaissance oil paintings to deteriorate physically when subject to climatic changes have found that the oil paint used in these paintings actually adjusts to these changes well. The restorers therefore hypothesize that it is a layer of material called gesso, which is under the paint, that causes the deterioration.

Which of the following, if true, most strongly supports the restorers' hypothesis?

- A. Renaissance oil paintings with a thin layer of gesso are less likely to show deterioration in response to climatic changes than those with a thicker layer.
  - B. Renaissance oil paintings are often painted on wooden panels, which swell when humidity increases and contract when it declines.
  - C. Oil paint expands and contracts readily in response to changes in temperature, but it absorbs little water and so is little affected by changes in humidity.
  - D. An especially hard and nonabsorbent type of gesso was the raw material for moldings on the frames of Renaissance oil paintings.
  - E. Gesso layers applied by Renaissance painters typically consisted of a coarse base layer onto which several increasingly fine-grained layers were applied.
143. Automobile Dealer's Advertisement: The Highway Traffic Safety Institute reports that the PZ 1000 has the fewest injuries per accident of any car in its class. This shows that the PZ 1000 is one of the safest cars available today.

Which of the following, if true, most seriously weakens the argument in the advertisement?

- A. The Highway Traffic Safety Institute report listed many cars in other classes that had more injuries per accident than did the PZ 1000.
- B. In recent years many more PZ 1000s have been sold than have any other kind of car in its class.
- C. Cars in the class to which the PZ 1000 belongs are more likely to be involved in accidents than are other types of cars.
- D. The difference between the number of injuries per accident for the PZ 1000 and that for other cars in its class is quite pronounced.
- E. The Highway Traffic Safety Institute issues reports only once a year.

144. Archaeologists working in the Andes Mountains recently excavated a buried 4,000-year-old temple containing structures that align with a stone carving on a distant hill to indicate the direction of the rising sun at the summer solstice. Alignments in the temple were also found to point toward the position, at the summer solstice, of a constellation known in Andean culture as the Fox. Since the local mythology represents the fox as teaching people how to cultivate and irrigate plants, the ancient Andeans may have built the temple as a religious representation of the fox.

Which of the following is an assumption on which the argument is based?

- A. The constellation known as the Fox has the same position at the summer solstice as it did 4,000 years ago.
- B. In the region around the temple, the summer solstice marks the time for planting.
- C. The temple was protected from looters by dirt and debris built up over thousands of years.
- D. Other structural alignments at the temple point to further constellations with agricultural significance.
- E. The site containing the temple was occupied for a significant amount of time before abandonment.

145. Which of the following most logically completes the passage?

It is generally believed that people receiving frequent medical checkups are likely to need hospitalization less frequently than they would otherwise; after all, many things can be done following a checkup to prevent problems that, if ignored, might become acute and then require hospitalization. But for people with chronic illnesses, frequent medical checkups are likely to lead to more frequent hospitalization since \_\_\_\_\_.

- A. the recommended treatments for complications of many chronic illnesses involve hospitalization even if those complications are detected while barely noticeable
- B. medical checkups sometimes do not reveal early symptoms of those chronic illnesses that are best treated in a hospital

- C. the average length of a hospital stay is the same for those who receive frequent checkups as for those who do not
  - D. people with chronic illnesses generally receive medical checkups more frequently than people who are not chronically ill
  - E. the average length of a hospital stay for people with a chronic illness tends to increase as the illness progresses
146. Meat from chickens contaminated with salmonella bacteria can cause serious food poisoning. Capsaicin, the chemical that gives chili peppers their hot flavor, has antibacterial properties. Chickens do not have taste receptors for capsaicin and will readily eat feed laced with capsaicin. When chickens were fed such feed and then exposed to salmonella bacteria, relatively few of them became contaminated with salmonella.

In deciding whether the feed would be useful in raising salmonella-free chicken for retail sale, it would be most helpful to determine which of the following?

- A. Whether feeding capsaicin to chickens affects the taste of their meat
  - B. Whether eating capsaicin reduces the risk of salmonella poisoning for humans
  - C. Whether chicken is more prone to salmonella contamination than other kinds of meat
  - D. Whether appropriate cooking of chicken contaminated with salmonella can always prevent food poisoning
  - E. Whether capsaicin can be obtained only from chili peppers
147. Laws requiring the use of headlights during daylight hours can prevent automobile collisions. However, since daylight visibility is worse in countries farther from the equator, any such laws would obviously be more effective in preventing collisions in those countries. In fact, the only countries that actually have such laws are farther from the equator than is the continental United States.

Which of the following conclusions could be most properly drawn

from the information given above?

- A. Drivers in the continental United States who used their headlights during the day would be just as likely to become involved in a collision as would drivers who did not use their headlights.
  - B. In many countries that are farther from the equator than is the continental United States, poor daylight visibility is the single most important factor in automobile collisions.
  - C. The proportion of automobile collisions that occur in the daytime is greater in the continental United States than in the countries that have daytime headlight laws.
  - D. Fewer automobile collisions probably occur each year in countries that have daytime headlight laws than occur within the continental United States.
  - E. Daytime headlight laws would probably do less to prevent automobile collisions in the continental United States than they do in the countries that have the laws.
148. Which of the following most logically completes the argument below?

When mercury-vapor streetlights are used in areas inhabited by insect-eating bats, the bats feed almost exclusively around the lights, because the lights attract flying insects. In Greenville, the mercury-vapor streetlights are about to be replaced with energy-saving sodium streetlights, which do not attract insects. This change is likely to result in a drop in the population of insect-eating bats in Greenville, since \_\_\_\_\_.

- A. the bats do not begin to hunt until after sundown
- B. the bats are unlikely to feed on insects that do not fly
- C. the highway department will be able to replace mercury-vapor streetlights with sodium streetlights within a relatively short time and without disrupting the continuity of lighting at the locations of the streetlights
- D. in the absence of local concentrations of the flying insects on which bats feed, the bats expend much more energy on

hunting for food, requiring much larger quantities of insects to sustain each bat

- E. bats use echolocation to catch insects and therefore gain no advantage from the fact that insects flying in the vicinity of streetlights are visible at night

149. Rats injected with morphine exhibit decreased activity of the immune system, the bodily system that fights off infections. These same rats exhibited heightened blood levels of corticosteroids, chemicals secreted by the adrenal glands. Since corticosteroids can interfere with immune-system activity, scientists hypothesized that the way morphine reduces immune responses in rats is by stimulating the adrenal glands to secrete additional corticosteroids into the bloodstream.

Which of the following experiments would yield the most useful results for evaluating the scientists' hypothesis?

- A. Injecting morphine into rats that already have heightened blood levels of corticosteroids and then observing their new blood levels of corticosteroids
  - B. Testing the level of immune-system activity of rats, removing their adrenal glands, and then testing the rats' immune-system activity levels again
  - C. Injecting rats with corticosteroids and then observing how many of the rats contracted infections
  - D. Removing the adrenal glands of rats, injecting the rats with morphine, and then testing the level of the rats' immune-system responses
  - E. Injecting rats with a drug that stimulates immune-system activity and then observing the level of corticosteroids in their bloodstreams
150. Curator: If our museum lends *Venus* to the Hart Institute for their show this spring, they will lend us their Rembrandt etchings for our print exhibition next fall. Having those etchings will increase attendance to the exhibition and hence increase revenue from our general admission fee.

Museum Administrator: But *Venus* is our biggest attraction. Moreover the Hart's show will run for twice as long as our exhibition. So on balance the number of patrons may decrease.

The point of the administrator's response to the curator is to question

- A. whether getting the Rembrandt etchings from the Hart Institute is likely to increase attendance at the print exhibition
  - B. whether the Hart Institute's Rembrandt etchings will be appreciated by those patrons of the curator's museum for whom the museum's biggest attraction is *Venus*
  - C. whether the number of patrons attracted by the Hart Institute's Rembrandt etchings will be larger than the number of patrons who do not come in the spring because *Venus* is on loan
  - D. whether, if *Venus* is lent, the museum's revenue from general admission fees during the print exhibition will exceed its revenue from general admission fees during the Hart Institute's exhibition
  - E. whether the Hart Institute or the curator's museum will have the greater financial gain from the proposed exchange of artworks
151. Which of the following most logically completes the passage?
- Leaf beetles damage willow trees by stripping away their leaves, but a combination of parasites and predators generally keeps populations of these beetles in check. Researchers have found that severe air pollution results in reduced predator populations. The parasites, by contrast, are not adversely affected by pollution; nevertheless, the researchers' discovery probably does explain why leaf beetles cause particularly severe damage to willows in areas with severe air pollution, since \_\_\_\_\_.
- A. neither the predators nor the parasites of leaf beetles themselves attack willow trees
  - B. the parasites that attack leaf beetles actually tend to be



more prevalent in areas with severe air pollution than they are elsewhere

- C. the damage caused by leaf beetles is usually not enough to kill a willow tree outright
- D. where air pollution is not especially severe, predators have much more impact on leaf-beetle populations than parasites do
- E. willows often grow in areas where air pollution is especially severe

152. Which of the following best completes the passage below?

At a recent conference on environmental threats to the North Sea, most participating countries favored uniform controls on the quality of effluents, whether or not specific environmental damage could be attributed to a particular source of effluent. What must, of course, be shown, in order to avoid excessively restrictive controls, is that \_\_\_\_\_.

- A. any uniform controls that are adopted are likely to be implemented without delay
- B. any substance to be made subject to controls can actually cause environmental damage
- C. the countries favoring uniform controls are those generating the largest quantities of effluents
- D. all of any given pollutant that is to be controlled actually reaches the North Sea at present
- E. environmental damage already inflicted on the North Sea is reversible

153. On May first, in order to reduce the number of overdue books, a children's library instituted a policy of forgiving fines and giving bookmarks to children returning all of their overdue books. On July first there were twice as many overdue books as there had been on May first, although a record number of books had been returned during the interim.

Which of the following, if true, most helps to explain the apparent

inconsistency in the results of the library's policy?

- A. The librarians did not keep accurate records of how many children took advantage of the grace period, and some of the children returning overdue books did not return all of their overdue books.
  - B. Although the grace period enticed some children to return all of their overdue books, it did not convince all of the children with overdue books to return all of their books.
  - C. The bookmarks became popular among the children, so in order to collect the bookmarks, many children borrowed many more books than they usually did and kept them past their due date.
  - D. The children were allowed to borrow a maximum of five books for a two-week period, and hence each child could keep a maximum of fifteen books beyond their due date within a two-month period.
  - E. Although the library forgave overdue fines during the grace period, the amount previously charged the children was minimal; hence, the forgiveness of the fines did not provide enough incentive for them to return their overdue books.
154. A certain species of desert lizard digs tunnels in which to lay its eggs. The eggs must incubate inside the tunnel for several weeks before hatching, and they fail to hatch if they are disturbed at any time during this incubation period. Yet these lizards guard their tunnels for only a few days after laying their eggs.

Which of the following, if true, most helps explain why there is no need for lizards to guard their tunnels for more than a few days?

- A. The eggs are at risk of being disturbed only during the brief egg-laying season when many lizards are digging in a relatively small area.
- B. The length of the incubation period varies somewhat from one tunnel to another.
- C. Each female lizard lays from 15 to 20 eggs, only about 10 of which hatch even if the eggs are not disturbed at any time

during the incubation period.

- D. The temperature and humidity within the tunnels will not be suitable for the incubating eggs unless the tunnels are plugged with sand immediately after the eggs are laid.
  - E. The only way to disturb the eggs of this lizard species is by opening up one of the tunnels in which they are laid.
155. Often patients with ankle fractures that are stable, and thus do not require surgery, are given follow-up x-rays because their orthopedists are concerned about possibly having misjudged the stability of the fracture. When a number of follow-up x-rays were reviewed, however, all the fractures that had initially been judged stable were found to have healed correctly. Therefore, it is a waste of money to order follow-up x-rays of ankle fractures initially judged stable.

Which of the following, if true, most strengthens the argument?

- A. Doctors who are general practitioners rather than orthopedists are less likely than orthopedists to judge the stability of an ankle fracture correctly.
  - B. Many ankle injuries for which an initial x-ray is ordered are revealed by the x-ray not to involve any fracture of the ankle.
  - C. X-rays of patients of many different orthopedists working in several hospitals were reviewed.
  - D. The healing of ankle fractures that have been surgically repaired is always checked by means of a follow-up x-ray.
  - E. Orthopedists routinely order follow-up x-rays for fractures of bones other than ankle bones.
156. In setting environmental standards for industry and others to meet, it is inadvisable to require the best results that state-of-the-art technology can achieve. Current technology is able to detect and eliminate even extremely minute amounts of contaminants, but at a cost that is exorbitant relative to the improvement achieved. So it would be reasonable instead to set standards by taking into account all of the current and future risks involved.

The argument given concerning the reasonable way to set standards presupposes that

- A. industry currently meets the standards that have been set by environmental authorities
  - B. there are effective ways to take into account all of the relevant risks posed by allowing different levels of contaminants
  - C. the only contaminants worth measuring are generated by industry
  - D. it is not costly to prevent large amounts of contaminants from entering the environment
  - E. minute amounts of some contaminants can be poisonous
157. Most scholars agree that King Alfred (A.D. 849–899) personally translated a number of Latin texts into Old English. One historian contends that Alfred also personally penned his own law code, arguing that the numerous differences between the language of the law code and Alfred’s translations of Latin texts are outweighed by the even more numerous similarities. Linguistic similarities, however, are what one expects in texts from the same language, the same time, and the same region. Apart from Alfred’s surviving translations and law code, there are only two other extant works from the same dialect and milieu, so it is risky to assume here that linguistic similarities point to common authorship.

The passage above proceeds by

- A. providing examples that underscore another argument’s conclusion
- B. questioning the plausibility of an assumption on which another argument depends
- C. showing that a principle if generally applied would have anomalous consequences
- D. showing that the premises of another argument are mutually inconsistent

E. using argument by analogy to undermine a principle implicit in another argument

158. A company plans to develop a prototype weeding machine that uses cutting blades with optical sensors and microprocessors that distinguish weeds from crop plants by differences in shade of color. The inventor of the machine claims that it will reduce labor costs by virtually eliminating the need for manual weeding.

Which of the following is a consideration in favor of the company's implementing its plan to develop the prototype?

- A. There is a considerable degree of variation in shade of color between weeds of different species.
  - B. The shade of color of some plants tends to change appreciably over the course of their growing season.
  - C. When crops are weeded manually, overall size and leaf shape are taken into account in distinguishing crop plants from weeds.
  - D. Selection and genetic manipulation allow plants of virtually any species to be economically bred to have a distinctive shade of color without altering their other characteristics.
  - E. Farm laborers who are responsible for the manual weeding of crops carry out other agricultural duties at times in the growing season when extensive weeding is not necessary.
159. A certain mayor has proposed a fee of five dollars per day on private vehicles entering the city, claiming that the fee will alleviate the city's traffic congestion. The mayor reasons that, since the fee will exceed the cost of round-trip bus fare from many nearby points, many people will switch from using their cars to using the bus.

Which of the following statements, if true, provides the best evidence that the mayor's reasoning is flawed?

- A. Projected increases in the price of gasoline will increase the cost of taking a private vehicle into the city.
- B. The cost of parking fees already makes it considerably more expensive for most people to take a private vehicle into the

city than to take a bus.

- C. Most of the people currently riding the bus do not own private vehicles.
- D. Many commuters opposing the mayor's plan have indicated that they would rather endure traffic congestion than pay a five-dollar-per-day fee.
- E. During the average workday, private vehicles owned and operated by people living within the city account for 20 percent of the city's traffic congestion.

160. Aroca City currently funds its public schools through taxes on property. **In place of this system, the city plans to introduce a sales tax of 3 percent on all retail sales in the city.** Critics protest that 3 percent of current retail sales falls short of the amount raised for schools by property taxes. The critics are correct on this point. **Nevertheless, implementing the plan will probably not reduce the money going to Aroca's schools.** Several large retailers have selected Aroca City as the site for huge new stores, and these are certain to draw large numbers of shoppers from neighboring municipalities, where sales are taxed at rates of 6 percent and more. In consequence, retail sales in Aroca City are bound to increase substantially.

In the argument given, the two portions in **boldface** play which of the following roles?

- A. The first presents a plan that the argument concludes is unlikely to achieve its goal; the second expresses that conclusion.
- B. The first presents a plan that the argument concludes is unlikely to achieve its goal; the second presents evidence in support of that conclusion.
- C. The first presents a plan that the argument contends is the best available; the second is a conclusion drawn by the argument to justify that contention.
- D. The first presents a plan one of whose consequences is at issue in the argument; the second is the argument's conclusion about that consequence.

- E. The first presents a plan that the argument seeks to defend against a certain criticism; the second is that criticism.

161. Which of the following most logically completes the argument?

A photograph of the night sky was taken with the camera shutter open for an extended period. The normal motion of stars across the sky caused the images of the stars in the photograph to appear as streaks. However, one bright spot was not streaked. Even if the spot were caused, as astronomers believe, by a celestial object, that object could still have been moving across the sky during the time the shutter was open, since \_\_\_\_\_.

- A. the spot was not the brightest object in the photograph
  - B. the photograph contains many streaks that astronomers can identify as caused by noncelestial objects
  - C. stars in the night sky do not appear to shift position relative to each other
  - D. the spot could have been caused by an object that emitted a flash that lasted for only a fraction of the time that the camera shutter was open
  - E. if the camera shutter had not been open for an extended period, it would have recorded substantially fewer celestial objects
162. Economist: Paying extra for fair-trade coffee—coffee labeled with the Fairtrade logo—is intended to help poor farmers, because they receive a higher price for the fair-trade coffee they grow. But this practice may hurt more farmers in developing nations than it helps. By raising average prices for coffee, it encourages more coffee to be produced than consumers want to buy. This lowers prices for non-fair-trade coffee and thus lowers profits for non-fair-trade coffee farmers.

To evaluate the strength of the economist's argument, it would be most helpful to know which of the following?

- A. Whether there is a way of alleviating the impact of the increased average prices for coffee on non-fair-trade coffee

farmers' profits

- B. What proportion of coffee farmers in developing nations produce fair-trade coffee
  - C. Whether many coffee farmers in developing nations also derive income from other kinds of farming
  - D. Whether consumers should pay extra for fair-trade coffee if doing so lowers profits for non-fair-trade coffee farmers
  - E. How fair-trade coffee farmers in developing nations could be helped without lowering profits for non-fair-trade coffee farmers
163. Tanco, a leather manufacturer, uses large quantities of common salt to preserve animal hides. New environmental regulations have significantly increased the cost of disposing of salt water that results from this use, and, in consequence, Tanco is considering a plan to use potassium chloride in place of common salt. Research has shown that Tanco could reprocess the by-product of potassium chloride use to yield a crop fertilizer, leaving a relatively small volume of waste for disposal.

In determining the impact on company profits of using potassium chloride in place of common salt, it would be important for Tanco to research all of the following EXCEPT:

- A. What difference, if any, is there between the cost of the common salt needed to preserve a given quantity of animal hides and the cost of the potassium chloride needed to preserve the same quantity of hides?
- B. To what extent is the equipment involved in preserving animal hides using common salt suitable for preserving animal hides using potassium chloride?
- C. What environmental regulations, if any, constrain the disposal of the waste generated in reprocessing the by-product of potassium chloride?
- D. How closely does leather that results when common salt is used to preserve hides resemble that which results when potassium chloride is used?



- E. Are the chemical properties that make potassium chloride an effective means for preserving animal hides the same as those that make common salt an effective means for doing so?
164. Colorless diamonds can command high prices as gemstones. A type of less valuable diamonds can be treated to remove all color. Only sophisticated tests can distinguish such treated diamonds from naturally colorless ones. However, only 2 percent of diamonds mined are of the colored type that can be successfully treated, and many of those are of insufficient quality to make the treatment worthwhile. Surely, therefore, the vast majority of colorless diamonds sold by jewelers are naturally colorless.
- A serious flaw in the reasoning of the argument is that
- A. comparisons between the price diamonds command as gemstones and their value for other uses are omitted
  - B. information about the rarity of treated diamonds is not combined with information about the rarity of naturally colorless, gemstone diamonds
  - C. the possibility that colored diamonds might be used as gemstones, even without having been treated, is ignored
  - D. the currently available method for making colorless diamonds from colored ones is treated as though it were the only possible method for doing so
  - E. the difficulty that a customer of a jeweler would have in distinguishing a naturally colorless diamond from a treated one is not taken into account
165. The Sumpton town council recently voted to pay a prominent artist to create an abstract sculpture for the town square. Critics of this decision protested that town residents tend to dislike most abstract art, and any art in the town square should reflect their tastes. But a town council spokesperson dismissed this criticism, pointing out that other public abstract sculptures that the same sculptor has installed in other cities have been extremely popular with those cities' local residents.

The statements above most strongly suggest that the main point

of disagreement between the critics and the spokesperson is whether

- A. it would have been reasonable to consult town residents on the decision
  - B. most Sumpton residents will find the new sculpture to their taste
  - C. abstract sculptures by the same sculptor have truly been popular in other cities
  - D. a more traditional sculpture in the town square would be popular among local residents
  - E. public art that the residents of Sumpton would find desirable would probably be found desirable by the residents of other cities
166. Jay: Of course there are many good reasons to support the expansion of preventive medical care, but arguments claiming that it will lead to greater societal economic gains are misguided. Some of the greatest societal expenses arise from frequent urgent-care needs for people who have attained a long life due to preventive care.
- Sunil: Your argument fails because you neglect economic gains outside the health care system: society suffers an economic loss when any of its productive members suffer preventable illnesses.
- Sunil's response to Jay makes which of the following assumptions?
- A. Those who receive preventive care are not more likely to need urgent care than are those who do not receive preventive care.
  - B. Jay intends the phrase "economic gains" to refer only to gains accruing to institutions within the health care system.
  - C. Productive members of society are more likely than others to suffer preventable illnesses.
  - D. The economic contributions of those who receive preventive medical care may outweigh the economic losses caused by

preventive care.

E. Jay is incorrect in stating that patients who receive preventive medical care are long-lived.

167. Boreal owls range over a much larger area than do other owls of similar size. The reason for this behavior is probably that the small mammals on which owls feed are especially scarce in the forests where boreal owls live, and the relative scarcity of prey requires the owls to range more extensively to find sufficient food.

Which of the following, if true, most helps to confirm the explanation above?

- A. Some boreal owls range over an area eight times larger than the area over which any other owl of similar size ranges.
  - B. Boreal owls range over larger areas in regions where food of the sort eaten by small mammals is sparse than they do in regions where such food is abundant.
  - C. After their young hatch, boreal owls must hunt more often than before in order to feed both themselves and their newly hatched young.
  - D. Sometimes individual boreal owls hunt near a single location for many weeks at a time and do not range farther than a few hundred yards.
  - E. The boreal owl requires less food, relative to its weight, than is required by members of other owl species.
168. Microbiologist: A lethal strain of salmonella recently showed up in a European country, causing an outbreak of illness that killed two people and infected twenty-seven others. Investigators blame the severity of the outbreak on the overuse of antibiotics, since the salmonella bacteria tested were shown to be drug-resistant. But this is unlikely because patients in the country where the outbreak occurred cannot obtain antibiotics to treat illness without a prescription, and the country's doctors prescribe antibiotics less readily than do doctors in any other European country.

Which of the following, if true, would most weaken the microbiologist's reasoning?

- A. Physicians in the country where the outbreak occurred have become hesitant to prescribe antibiotics since they are frequently in short supply.
  - B. People in the country where the outbreak occurred often consume foods produced from animals that eat antibiotics-laden livestock feed.
  - C. Use of antibiotics in two countries that neighbor the country where the outbreak occurred has risen over the past decade.
  - D. Drug-resistant strains of salmonella have not been found in countries in which antibiotics are not generally available.
  - E. Salmonella has been shown to spread easily along the distribution chains of certain vegetables, such as raw tomatoes.
169. Historian: Newton developed mathematical concepts and techniques that are fundamental to modern calculus. Leibniz developed closely analogous concepts and techniques. It has traditionally been thought that these discoveries were independent. Researchers have, however, recently discovered notes of Leibniz's that discuss one of Newton's books on mathematics. Several scholars have argued that since **the book includes a presentation of Newton's calculus concepts and techniques**, and since the notes were written before Leibniz's own development of calculus concepts and techniques, it is virtually certain **that the traditional view is false**. A more cautious conclusion than this is called for, however. Leibniz's notes are limited to early sections of Newton's book, sections that precede the ones in which Newton's calculus concepts and techniques are presented.

In the historian's reasoning, the two portions in **boldface** play which of the following roles?

- A. The first is a claim that the historian rejects; the second is a position that that claim has been used to support.

- B. The first is evidence that has been used to support a conclusion about which the historian expresses reservations; the second is that conclusion.
  - C. The first provides evidence in support of a position that the historian defends; the second is that position.
  - D. The first and the second each provide evidence in support of a position that the historian defends.
  - E. The first has been used in support of a position that the historian rejects; the second is a conclusion that the historian draws from that position.
170. For over two centuries, no one had been able to make Damascus blades—blades with a distinctive serpentine surface pattern—but a contemporary sword maker may just have rediscovered how. Using iron with trace impurities that precisely matched those present in the iron used in historic Damascus blades, this contemporary sword maker seems to have finally hit on an intricate process by which he can produce a blade indistinguishable from a true Damascus blade.

Which of the following, if true, provides the strongest support for the hypothesis that trace impurities in the iron are essential for the production of Damascus blades?

- A. There are surface features of every Damascus blade—including the blades produced by the contemporary sword maker—that are unique to that blade.
- B. The iron with which the contemporary sword maker made Damascus blades came from a source of iron that was unknown two centuries ago.
- C. Almost all the tools used by the contemporary sword maker were updated versions of tools that were used by sword makers over two centuries ago.
- D. Production of Damascus blades by sword makers of the past ceased abruptly after those sword makers' original source of iron became exhausted.
- E. Although Damascus blades were renowned for maintaining

a sharp edge, the blade made by the contemporary sword maker suggests that they may have maintained their edge less well than blades made using what is now the standard process for making blades.

171. Images from ground-based telescopes are invariably distorted by the Earth's atmosphere. Orbiting space telescopes, however, operating above Earth's atmosphere, should provide superbly detailed images. Therefore, ground-based telescopes will soon become obsolete for advanced astronomical research purposes.

Which of the following statements, if true, would cast the most doubt on the conclusion drawn above?

- A. An orbiting space telescope due to be launched this year is far behind schedule and over budget, whereas the largest ground-based telescope was both within budget and on schedule.
  - B. Ground-based telescopes located on mountain summits are not subject to the kinds of atmospheric distortion which, at low altitudes, make stars appear to twinkle.
  - C. By careful choice of observatory location, it is possible for large-aperture telescopes to avoid most of the kind of wind turbulence that can distort image quality.
  - D. When large-aperture telescopes are located at high altitudes near the equator, they permit the best Earth-based observations of the center of the Milky Way Galaxy, a prime target of astronomical research.
  - E. Detailed spectral analyses, upon which astronomers rely for determining the chemical composition and evolutionary history of stars, require telescopes with more light-gathering capacity than space telescopes can provide.
172. Generally scientists enter their field with the goal of doing important new research and accept as their colleagues those with similar motivation. Therefore, when any scientist wins renown as an expounder of science to general audiences, most other scientists conclude that this popularizer should no longer be regarded as a true colleague.

The explanation offered above for the low esteem in which scientific popularizers are held by research scientists assumes that

- A. serious scientific research is not a solitary activity, but relies on active cooperation among a group of colleagues
  - B. research scientists tend not to regard as colleagues those scientists whose renown they envy
  - C. a scientist can become a famous popularizer without having completed any important research
  - D. research scientists believe that those who are well known as popularizers of science are not motivated to do important new research
  - E. no important new research can be accessible to or accurately assessed by those who are not themselves scientists
173. Urban planner: When a city loses population due to migration, property taxes in that city tend to rise. This is because there are then fewer residents paying to maintain an infrastructure that was designed to support more people. Rising property taxes, in turn, drive more residents away, compounding the problem. Since the city of Stonebridge is starting to lose population, the city government should therefore refrain from raising property taxes.

Which of the following, if true, would most weaken the urban planner's argument?

- A. If Stonebridge does not raise taxes on its residents to maintain its infrastructure, the city will become much less attractive to live in as that infrastructure decays.
- B. Stonebridge at present benefits from grants provided by the national government to help maintain certain parts of its infrastructure.
- C. If there is a small increase in property taxes in Stonebridge and a slightly larger proportion of total revenue than at present is allocated to infrastructure maintenance, the

funding will be adequate for that purpose.

- D. Demographers project that the population of a region that includes Stonebridge will start to increase substantially within the next several years.
- E. The property taxes in Stonebridge are significantly lower than those in many larger cities.

174. Which of the following most logically completes the argument?

Utrania was formerly a major petroleum exporter, but in recent decades economic stagnation and restrictive regulations inhibited investment in new oil fields. In consequence, Utranian oil exports dropped steadily as old fields became depleted. Utrania's currently improving economic situation, together with less-restrictive regulations, will undoubtedly result in the rapid development of new fields. However, it would be premature to conclude that the rapid development of new fields will result in higher oil exports, because \_\_\_\_\_.

- A. the price of oil is expected to remain relatively stable over the next several years
- B. the improvement in the economic situation in Utrania is expected to result in a dramatic increase in the proportion of Utranians who own automobiles
- C. most of the investment in new oil fields in Utrania is expected to come from foreign sources
- D. new technology is available to recover oil from old oil fields formerly regarded as depleted
- E. many of the new oil fields in Utrania are likely to be as productive as those that were developed during the period when Utrania was a major oil exporter

175. The use of growth-promoting antibiotics in hog farming can weaken their effectiveness in treating humans because such use can spread resistance to those antibiotics among microorganisms. But now the Smee Company, one of the largest pork marketers, may stop buying pork raised on feed containing these antibiotics. Smee has 60 percent of the pork market, and farmers who sell to



Smee would certainly stop using antibiotics in order to avoid jeopardizing their sales. So if Smee makes this change, it will probably significantly slow the decline in antibiotics' effectiveness for humans.

Which of the following, if true, would most strengthen the argument above?

- A. Other major pork marketers will probably stop buying pork raised on feed containing growth-promoting antibiotics if Smee no longer buys such pork.
  - B. The decline in hog growth due to discontinuation of antibiotics can be offset by improved hygiene.
  - C. Authorities are promoting the use of antibiotics to which microorganisms have not yet developed resistance.
  - D. A phaseout of use of antibiotics for hogs in one country reduced usage by over 50 percent over five years.
  - E. If Smee stops buying pork raised with antibiotics, the firm's costs will probably increase.
176. In an experiment, volunteers walked individually through a dark, abandoned theater. Half of the volunteers had been told that the theater was haunted and the other half that it was under renovation. The first half reported significantly more unusual experiences than the second did. The researchers concluded that reports of encounters with ghosts and other supernatural entities generally result from prior expectations of such experiences.

Which of the following, if true, would most seriously weaken the researchers' reasoning?

- A. None of the volunteers in the second half believed that the unusual experiences they reported were supernatural.
- B. All of the volunteers in the first half believed that the researchers' statement that the theater was haunted was a lie.
- C. Before being told about the theater, the volunteers within each group varied considerably in their prior beliefs about supernatural experiences.

- D. Each unusual experience reported by the volunteers had a cause that did not involve the supernatural.
- E. The researchers did not believe that the theater was haunted.

177. In order to reduce dependence on imported oil, the government of Jalica has imposed minimum fuel-efficiency requirements on all new cars, beginning this year. The more fuel-efficient a car, the less pollution it produces per mile driven. As Jalicans replace their old cars with cars that meet the new requirements, annual pollution from car traffic is likely to decrease in Jalica.

Which of the following, if true, most seriously weakens the argument?

- A. In Jalica, domestically produced oil is more expensive than imported oil.
  - B. The Jalican government did not intend the new fuel-efficiency requirement to be a pollution-reduction measure.
  - C. Some pollution-control devices mandated in Jalica make cars less fuel-efficient than they would be without those devices.
  - D. The new regulation requires no change in the chemical formulation of fuel for cars in Jalica.
  - E. Jalicans who get cars that are more fuel-efficient tend to do more driving than before.
178. Plantings of cotton bioengineered to produce its own insecticide against bollworms, a major cause of crop failure, sustained little bollworm damage until this year. This year the plantings are being seriously damaged by bollworms. Bollworms, however, are not necessarily developing resistance to the cotton's insecticide. Bollworms breed on corn, and last year more corn than usual was planted throughout cotton-growing regions. So it is likely that the cotton is simply being overwhelmed by corn-bred bollworms.

In evaluating the argument, which of the following would it be most useful to establish?

- A. Whether corn could be bioengineered to produce the

insecticide

- B. Whether plantings of cotton that does not produce the insecticide are suffering unusually extensive damage from bollworms this year
  - C. Whether other crops that have been bioengineered to produce their own insecticide successfully resist the pests against which the insecticide was to protect them
  - D. Whether plantings of bioengineered cotton are frequently damaged by insect pests other than bollworms
  - E. Whether there are insecticides that can be used against bollworms that have developed resistance to the insecticide produced by the bioengineered cotton
179. Typically during thunderstorms most lightning strikes carry a negative electric charge; only a few carry a positive charge. Thunderstorms with unusually high proportions of positive-charge strikes tend to occur in smoky areas near forest fires. The fact that smoke carries positively charged smoke particles into the air above a fire suggests the hypothesis that the extra positive strikes occur because of the presence of such particles in the storm clouds.

Which of the following, if discovered to be true, most seriously undermines the hypothesis?

- A. Other kinds of rare lightning also occur with unusually high frequency in the vicinity of forest fires.
- B. The positive-charge strikes that occur near forest fires tend to be no more powerful than positive strikes normally are.
- C. A positive-charge strike is as likely to start a forest fire as a negative-charge strike is.
- D. Thunderstorms that occur in drifting clouds of smoke have extra positive-charge strikes weeks after the charge of the smoke particles has dissipated.
- E. The total number of lightning strikes during a thunderstorm is usually within the normal range in the vicinity of a forest fire.

180. Many gardeners believe that the variety of clematis vine that is most popular among gardeners in North America is *jackmanii*. This belief is apparently correct since, of the one million clematis plants sold per year by the largest clematis nursery in North America, ten percent are *jackmanii*.

Which of the following is an assumption on which the argument depends?

- A. The nursery sells more than ten different varieties of clematis.
  - B. The largest clematis nursery in North America sells nothing but clematis plants.
  - C. Some of the *jackmanii* sold by the nursery are sold to gardeners outside North America.
  - D. Most North American gardeners grow clematis in their gardens.
  - E. For all nurseries in North America that specialize in clematis, at least ten percent of the clematis plants they sell are *jackmanii*.
181. Since 1990 the percentage of bacterial sinus infections in Aqadestan that are resistant to the antibiotic perxicillin has increased substantially. Bacteria can quickly develop resistance to an antibiotic when it is prescribed indiscriminately or when patients fail to take it as prescribed. Since perxicillin has not been indiscriminately prescribed, health officials hypothesize that the increase in perxicillin-resistant sinus infections is largely due to patients' failure to take this medication as prescribed.

Which of the following, if true of Aqadestan, provides most support for the health officials' hypothesis?

- A. Resistance to several other commonly prescribed antibiotics has not increased since 1990 in Aqadestan.
- B. A large number of Aqadestanis never seek medical help when they have a sinus infection.
- C. When it first became available, perxicillin was much more effective in treating bacterial sinus infections than any other

antibiotic used for such infections at the time.

- D. Many patients who take perxicillin experience severe side effects within the first few days of their prescribed regimen.
- E. Aqadestani health clinics provide antibiotics to their patients at cost.

182. Psychologist: In a study, researchers gave 100 volunteers a psychological questionnaire designed to measure their self-esteem. The researchers then asked each volunteer to rate the strength of his or her own social skills. The volunteers with the highest levels of self-esteem consistently rated themselves as having much better social skills than did the volunteers with moderate levels. This suggests that attaining an exceptionally high level of self-esteem greatly improves one's social skills.

The psychologist's argument is most vulnerable to criticism on which of the following grounds?

- A. It fails to adequately address the possibility that many of the volunteers may not have understood what the psychological questionnaire was designed to measure.
  - B. It takes for granted that the volunteers with the highest levels of self-esteem had better social skills than did the other volunteers, even before the former volunteers had attained their high levels of self-esteem.
  - C. It overlooks the possibility that people with very high levels of self-esteem may tend to have a less accurate perception of the strength of their own social skills than do people with moderate levels of self-esteem.
  - D. It relies on evidence from a group of volunteers that is too small to provide any support for any inferences regarding people in general.
  - E. It overlooks the possibility that factors other than level of self-esteem may be of much greater importance in determining the strength of one's social skills.
183. A product that represents a clear technological advance over competing products can generally command a high price.

Because **technological advances tend to be quickly surpassed** and companies want to make large profits while they still can, **many companies charge the maximum possible price for such a product**. But large profits on the new product will give competitors a strong incentive to quickly match the new product's capabilities. Consequently, the strategy to maximize overall profit from a new product is to charge less than the greatest possible price.

In the argument above, the two portions in **boldface** play which of the following roles?

- A. The first is a consideration raised to argue that a certain strategy is counterproductive; the second presents that strategy.
  - B. The first is a consideration raised to support the strategy that the argument recommends; the second presents that strategy.
  - C. The first is a consideration raised to help explain the popularity of a certain strategy; the second presents that strategy.
  - D. The first is an assumption, rejected by the argument, that has been used to justify a course of action; the second presents that course of action.
  - E. The first is a consideration that has been used to justify adopting a certain strategy; the second presents the intended outcome of that strategy.
184. Gortland has long been narrowly self-sufficient in both grain and meat. However, as per capita income in Gortland has risen toward the world average, per capita consumption of meat has also risen toward the world average, and it takes several pounds of grain to produce one pound of meat. Therefore, since per capita income continues to rise, whereas domestic grain production will not increase, Gortland will soon have to import either grain or meat or both.

Which of the following is an assumption on which the argument depends?

- A. The total acreage devoted to grain production in Gortland will not decrease substantially.
- B. The population of Gortland has remained relatively constant during the country's years of growing prosperity.
- C. The per capita consumption of meat in Gortland is roughly the same across all income levels.
- D. In Gortland, neither meat nor grain is subject to government price controls.
- E. People in Gortland who increase their consumption of meat will not radically decrease their consumption of grain.

185. Political Advertisement:

Mayor Delmont's critics complain about the jobs that were lost in the city under Delmont's leadership. Yet the fact is that not only were more jobs created than were eliminated, but each year since Delmont took office the average pay for the new jobs created has been higher than that year's average pay for jobs citywide. So it stands to reason that throughout Delmont's tenure the average paycheck in this city has been getting steadily bigger.

Which of the following, if true, most seriously weakens the argument in the advertisement?

- A. The unemployment rate in the city is higher today than it was when Mayor Delmont took office.
  - B. The average pay for jobs in the city was at a ten-year low when Mayor Delmont took office.
  - C. Each year during Mayor Delmont's tenure, the average pay for jobs that were eliminated has been higher than the average pay for jobs citywide.
  - D. Most of the jobs eliminated during Mayor Delmont's tenure were in declining industries.
  - E. The average pay for jobs in the city is currently lower than it is for jobs in the suburbs surrounding the city.
186. To prevent a newly built dam on the Chiff River from blocking the route of fish migrating to breeding grounds upstream, the dam

includes a fish pass, a mechanism designed to allow fish through the dam. Before the construction of the dam and fish pass, several thousand fish a day swam upriver during spawning season. But in the first season after the project's completion, only 300 per day made the journey. Clearly, the fish pass is defective.

Which of the following, if true, most seriously weakens the argument?

- A. Fish that have migrated to the upstream breeding grounds do not return down the Chiff River again.
  - B. On other rivers in the region, the construction of dams with fish passes has led to only small decreases in the number of fish migrating upstream.
  - C. The construction of the dam stirred up potentially toxic river sediments that were carried downstream.
  - D. Populations of migratory fish in the Chiff River have been declining slightly over the last 20 years.
  - E. During spawning season, the dam releases sufficient water for migratory fish below the dam to swim upstream.
187. Music critic: Fewer and fewer musicians are studying classical music, decreasing the likelihood that those with real aptitude for such music will be performing it. Audiences who hear these performances will not appreciate classical music's greatness and will thus decamp to other genres. So to maintain classical music's current meager popularity, we must encourage more young musicians to enter the field.

Which of the following, if true, most weakens the music critic's reasoning?

- A. Musicians who choose to study classical music do so because they believe they have an aptitude for the music.
- B. Classical music's current meager popularity is attributable to the profusion of other genres of music available to listeners.
- C. Most people who appreciate classical music come to do so through old recordings rather than live performances.



- D. It is possible to enjoy the music in a particular genre even when it is performed by musicians who are not ideally suited for that genre.
  - E. The continued popularity of a given genre of music depends in part on the audiences being able to understand why that genre attained its original popularity.
188. Commemorative plaques cast from brass are a characteristic art form of the Benin culture of West Africa. Some scholars, noting that the oldest surviving plaques date to the 1400s, hypothesize that brass-casting techniques were introduced by the Portuguese, who came to Benin in 1485 A.D. But Portuguese records of that expedition mention cast-brass jewelry sent to Benin's king from neighboring Ife. So it is unlikely that Benin's knowledge of brass casting derived from the Portuguese.

Which of the following, if true, most strengthens the argument?

- A. The Portuguese records do not indicate whether their expedition of 1485 included metalworkers.
- B. The Portuguese had no contact with Ife until the 1500s.
- C. In the 1400s the Portuguese did not use cast brass for commemorative plaques.
- D. As early as 1500 A.D., Benin artists were making brass plaques incorporating depictions of Europeans.
- E. Copper, which is required for making brass, can be found throughout Benin territory.

## 4.5 Answer Key

- 106. C
- 107. B
- 108. B
- 109. A
- 110. D
- 111. B